

SEQUENCE LISTING

In the following SEQ ID Nos. 1, 3, 5 the 5', coding sequence and 3' sequence of the relevant α -amylase genes are illustrated. The 5' sequence is the first separate part of the sequence written with lower case letters, the coding sequence is the intermediate part of the sequence, where the signal sequence is written with lower case letters and the sequence encoding the mature α -amylase is written with upper case letters, and the 3' sequence is the third separate part of the sequence written with lower case letters.

SEQ ID No. 1

cggaagattggaagtacaaaaataagcaaaagattgtcaatcatgtcatgagccatgcgg-gagacggaaaaatcgtctta
atgcacgatatttatgcaacgttcgcagatgctgctgaa-gagattattaaaaagctgaaagcaaaaggctatcaattggt
aactgtatctcagcttgaagaagtgaagaagcagagaggctattgaataaatgagtagaagcgccatatcggcgcttttc
tttggagaataatagggaaaaatggtacttgttaaaaatcggaatatttatacaacatcatatgtttcacattgaaagggaggagaatc

atgaaacaacaaaaacggctttacgcccgaattgctgacgctgttatttgcgctcatcttcttgcctgc
ctcattctgcagcagcggcgGCAAATCTTAATGGGACGCTGATGCAGTATTTTGAATGGTAC
A T G C C C A A T G A C G G C C A A
CATTGGAGGCGTTTGCAAAACGACTCGGCATATTTGGCTGAACACGGTATTACT
G C C G T C T G G A T T C C C C C G G C A T A T A A
GGGAACGAGCCAAGCGGATGTGGGCTACGGTGCTTACGACCTTTATGATTAGG
G G A G T T T C A T C A A A A A G G G A C G G T T C
GGACAAAGTACGGCACAAAAGGAGAGCTGCAATCTGCGATCAAAAGTCTTCATT
C C C G C G A C A T T A A C G T T T A C G G G G A T
GTGGTCATCAACCACAAAGGCGGCGCTGATGCGACCGAAGATGTAACCGCGGTT
G A A G T C G A T C C C G C T G A C C G C A A C C G
CGTAATTTTCAGGAGAACACCTAATTAAAGCCTGGACACATTTTCATTTCCGGG
G C G C G G C A G C A C A T A C A G C G A T T T T A
AATGGCATTGGTACCATTTTGACGGAACCGATTGGGACGAGTCCCGAAAGCTGA
A C C G C A T C T A T A A G T T T C A A G G A A A G
GCTTGGGATTGGGAAGTTTCCAATGAAAACGGCAACTATGATTATTTGATGTAT
G C C G A C A T C G A T T A T G A C C A T C C T G A

TGTCGCAGCAGAAATTAAGAGATGGGGCACTTGGTATGCCAATGAACTGCAATT
 G G A C G G T T T C C G T C T T G A T G C T G T C A
 AACACATTAATTTTCTTTTTTTCGGGATTGGGTAAATCATGTCAGGGAAAAAA
 C G G G G A A G G A A A T G T T T A C G G T A G C T
 5 GAATATTGGCAGAATGACTTGGGCGCGCTGGAAAACTATTTGAACAAAACAAAT
 T T T A A T C A T T C A G T G T T T G A C G T G C C
 GCTTCATTATCAGTTCCATGCTGCATCGACACAGGGAGGCGGCTATGATATGAG
 G A A A T T G C T G A A C G G T A C G G T C G T T T
 CCAAGCATCCGTTGAAATCGGTTACATTTGTCGATAACCATGATACACAGCCGG
 10 G G C A A T C G C T T G A G T C G A C T G T C C A A
 ACATGGTTTAAGCCGCTTGCTTACGCTTTTATTCTCACAAGGGAATCTGGATACC
 C T C A G G T T T T C T A C G G G G A T A T G T A
 CGGGACGAAAGGAGACTCCCAGCGCGAAATTCCTGCCTTGAAACACAAAATTG
 A A C C G A T C T T A A A A G C G A G A A A A C A G T
 15 ATGCGTACGGAGCACAGCATGATTATTTTCGACCACCATGACATTGTCGGCTGGA
 C A A G G G A A G G C G A C A G C T C G G T T G C A
 AATTCAGGTTTGGCGGCATTAATAACAGACGGACCCGGTGGGGCAAAGCGAAT
 G T A T G T C G G C C G G C A A A A C G C C G G T G A
 GACATGGCATGACATTACCGGAAACCGTTGGGAGCCGGTTGTCATCAATTCGGA
 20 A G G C T G G G G A G A G T T T C A C G T A A A C G
 GCGGGTCGGTTTCAATTTATGTTCAAAGATAG
 aagagcagagaggacggatttcctgaaggaaatccgttttttatttt

SEQ ID No. 2

25 ANLNGTLMQYFEWYMPNDGQHWRLQND SAYLAENGITAV
 WIPPAYKGTSQADVGYGAYDLYDLGEFHQKGTVRTKYGTK
 GELQSAIKSLHSRDIN VYGDVVINHKG GADATEDVTAVEV
 DPADRNRVISGEHLIKAWTHFHFPGRGSTYSDFKWHWYHF
 DGTDWDES RKL NRIYKFQ GKAWDWEVSNENGN YDYL MYAD
 30 IDYDHPDVAAEIKRWGTWYANELQLDGFR L DAVKHIKFSF
 LRDWVNHVREKTGKEMFTVAEYWQNDLGALENYLNKTNFN
 HSVFDVPLHYQFHAAS TQGGGYDMRKLLNGTVVSKHPLKS

VTFVDNHDTQPGQSLESTVQTFWKPLAYAFILTRESGYPO
VFYGD MYG TKGDSQREIPALKHKIEPILKARKQYAYGAQH
DYFDHHDIVGW TREGDSSVANSGLAALITDGP GGA KRMYV
GRQNAGETWHDITGNRSEPVVINSEGWGEFHVNGGSVSIY
5 VQR

SEQ ID No. 3

gccccgcacatacgaaaagactggctgaaaacattgagcctttgatgactgatgattggctgaagaagtggatcgattg
tttgagaaaagaagaagaccataaaaataccttgctgtcatcagacagggtatttttatgctgtccagactgtccgct
10 gtgtaaaaataaggaataaaggggggtgttatttttactgatatgtaaataataattgtataagaaaatgagaggg agaggaaac
atgattcaaaaacgaaagcggacagtttcgttcagacttggtgcttatgtgcacgctgttatttgtcagttt
gccgattacaaaacatcagccGTAAATGGCACGCTGATGCAGTATTTTGAATGGTATACGC
C G A A C G A C G G C C A G C A T T
15 GGAAACGATTGCAGAATGATGCGGAACATTTATCGGATATCGGAATCACTGCCG
T C T G G A T T C C T C C C G C A T A C A A A G G A
TTGAGCCAATCCGATAACGGATACGGACCTTATGATTTGTATGATTTAGGAGAA
T T C C A G C A A A A A G G G A C G G T C A G A A C
GAAATACGGCACAAAATCAGAGCTTCAAGATGCGATCGGCTCACTGCATTCCCCG
20 G A A C G T C C A A G T A T A C G G A G A T G T G G
TTTTGAATCATAAGGCTGGTGCTGATGCAACAGAAGATGTAAGTCCGTCGAAG
T C A A T C C G G C C A A T A G A A A T C A G G A A
ACTTCGGAGGAATATCAAATCAAAGCGTGGACGGATTTTCGTTTTCCGGGGCCGT
G G A A A C A C G T A C A G T G A T T T T A A A T G
25 GCATTGGTATCATTTCGACGGAGCGGACTGGGATGAATCCCGGAAGATCAGCCG
C A T C T T T A A G T T T C G T G G G G A A G G A A
AAGCGTGGGATTGGGAAGTATCAAGTGAAAACGGCAACTATGACTATTTAATGT
A T G C T G A T G T T G A C T A C G A C C A C C C T
GATGTCGTGGCAGAGACAAAAAATGGGGTATCTGGTATGCGAATGAACTGTCA
30 T T A G A C G G C T T C C G T A T T G A T G C C G C
CAAACATATTAAATTTTCATTTCTGCGTGATTGGGTTCAGGCGGTCAGACAGGC
G A C G G G A A A A G A A A T G T T T A C G G T T G
CGGAGTATTGGCAGAATAATGCCGGGAAACTCGAAAACACTTGAATAAAACA

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A G C T T T A A T C A A T C C G T G T T T G A T G T T
CCGCTTCATTTCAATTTACAGGCGGCTTCCTCACAAGGAGGCGGATATGATATG
A G G C G T T T G C T G G A C G G T A C C G T T G T
GTCCAGGCATCCGGAAAAGGCGGTTACATTTGTTGAAAATCATGACACACAGCC
5 G G G A C A G T C A T T G G A A T C G A C A G T C C
AAACTTGGTTTAAACCGCTTGCATACGCCTTTATTTTGACAAGAGAATCCGGTTA
T C C T C A G G T G T T C T A T G G G G A T A T G
TACGGGACAAAAGGGACATCGCCAAAGGAAATTCCCTCACTGAAAGATAATAT
A G A G C C G A T T T T A A A A G C G C G T A A G G A
10 GTACGCATACGGGCCCCAGCACGATTATATTGACCACCCGGATGTGATCGGATG
G A C G A G G G A A G G T G A C A G C T C C G C C G
CCAAATCAGGTTTGGCCGCTTTAATCACGGACGGACCCGGCGGATCAAAGCGGA
T G T A T G C C G G C C T G A A A A A T G C C G G C
GAGACATGGTATGACATAACGGGGCAACCGTTCAGATACTGTAAAAATCGGATCT
15 G A C G G C T G G G G A G A G T T T C A T G T A A A
CGATGGGTCCGTCTCCATTTATGTTTCAGAAATAA
g g t a a t a a a a a c a c c t c c a a g c t g a g t g c g g g t a t c a g c t t g g a
ggtgcgtttattttttcagccgtatgacaaggtcggcatcaggtgtgacaaatacggatgcttggtgtcataggtgaca
aatccgggttttgcgccgtttggcgttttcacatgtctgattttgtataatcaacaggcacggagccggaatctttcgc
20 cttgaaaaataagcggcgatcgtagctgcttccaatatggattgttcacgggatcgtgcttttaacacaacgtggg atcc

SEQ ID No. 4

VNGTLMQYFEWYTPNDGQHWKRLQND AEHLS DIGITAVWI
PPAYKGLSQSDNGYGPYDLYDLGEFQQKGTVRTKYGTKSE
25 LQDAIGSLHSRNVQVYGDVVLN HKAGADATEDVTAVEVNP
ANRNQETSEEYQIKAWTDFRFPGRGNTYSDFKWHWYHFDG
ADWDESRKISRIFKFRGEGKAWDWEVSSENGNYDYLMYAD
VDYDHPDVVAETKKWGIWYANELSLDGFRIDA AKH IKFSF
LRDWVQAVRQATGKEMFTVAEYWQNNAGKLENYLNKTSFN
30 QSVFDVPLHFNLQAASSQGGGYDMRRLLDGTVVSRHPEKA
VTFVENHDTQPGQSLESTVQTFWKPLAYAFILTRESGYRQ
VFYGD MYG TKGTSPKEIPSLKDNIEPILKARKEYAYGPQH

DYIDHPDVIGWTREGDSSAAKSGLAALITDGPGGSKRMYA
GLKNAGETWYDITGNRSDTVKIGSDGWGEFHVNDGSVSIY

SEQ ID No. 5

5 aaattcgatattgaaaacgattacaaataaaaattataatagacgtaaacgttcgaggggttgctcccttttactcttt
ttatgcaatcgttcccttaatttttgaagccaaaccgtcgaatgtaacatttgattaagggggaagggcatt
gtgct aacgtttcaccgcattcgaaggaatggatgttcctgctcggttttgcactgtctcgctgttctgcccacag
gacagcccgccaaggctGCCGCACCGTTTAACGGCACCATGATGCAGTATTTTGAATGGT
10 A C T T G C C G G A T G A T G G C A C G
TTATGGACCAAAGTGGCCAATGAAGCCAACAACCTTATCCAGCCTTGGCATCACC
G C T C T T T G G C T G C C G C C C G C T T A C A A
AGGAACAAGCCGCAGCGACGTAGGGTACGGAGTATACGACTTGTATGACCTCG
G C G A A T T C A A T C A A A A A G G G A C C G T C C
GCACAAAATACGGAACAAAAGCTCAATATCTTCAAGCCATTCAAGCCGCCACG
15 C C G C T G G A A T G C A A G T G T A C G C C G A T
GTCGTGTTTCGACCATAAAGGCGGCGCTGACGGCACGGAATGGGTGGACGCCGTC
G A A G T C A A T C C G T C G A C C G C A A C C A
AGAAATCTCGGGCACCTATCAAATCCAAGCATGGACGAAATTTGATTTTCCCGG
G C G G G G C A A C A C C T A C T C C A G C T T T A
20 AGTGGCGCTGGTACCATTTTACGGCGTTGATTGGGACGAAAGCCGAAAATTGA
G C C G C A T T T A C A A A T T C C G C G G C A T C
GGCAAAGCGTGGGATTGGGAAGTAGACACGGAAAACGGAAACTATGACTACTT
A A T G T A T G C C G A C C T T G A T A T G G A T C A
TCCCGAAGTCGTGACCGAGCTGAAAAACTGGGGGAAATGGTATGTCAACACAA
25 C G A A C A T T G A T G G G T T C C G G C T T G A T G
CCGTCAAGCATATTAAGTTCAGTTTTTTTCTGATTGGTTGTCGTATGTGCGTTC
T C A G A C T G G C A A G C C G C T A T T T A C C
GTCGGGGAATATTGGAGCTATGACATCAACAAGTTGCACAATTACATTACGAAA
A C A G A C G G A A C G A T G T C T T T G T T T G A
30 TGCCCCGTTACACAACAAATTTTATACCGCTTCCAAATCAGGGGGCGCATTGA
T A T G C G C A C G T T A A T G A C C A A T A C T C
TCATGAAAGATCAACCGACATTGGCCGTCACCTTCGTTGATAATCATGACACCG

A A C C C G G C C A A G C G C T G C A G T C A T G G
 G T C G A C C C A T G G T T C A A A C C G T T G G C T T A C G C C T T T A T T C T A A C T C G G C A G G A A
 G G A T A C C C G T G C G T C T T T T A T G G T G A
 C T A T T A T G G C A T T C C A C A A T A T A C A T T C C T T C G C T G A A A A G C A A A A T C G A T C C
 5 G C T C C T C A T C G C G C G C A G G G A T T A T G
 C T T A C G G A A C G C A A C A T G A T T A T C T T G A T C A C T C C G A C A T C A T C G G G T G G A C A A
 G G G A A G G G G G C A C T G A A A A A C C A G G A
 T C C G G A C T G G C C G C A C T G A T C A C C G A T G G G C C G G G A G G A A G C A A A T G G A T G T A
 C G T T G G C A A A C A A C A C G C T G G A A A A G T
 10 G T T C T A T G A C C T T A C C G G C A A C C G G A G T G A C A C C G T C A C C A T C A A C A G T G A T G G
 A T G G G G G G A A T T C A A A G T C A A T G G C G
 G T T C G G T T T C G G T T T G G G T T C C T A G A A A A C G A C C G T T T C T A C C A T C G C T C G G C C
 G A T C A C A A C C C G A C C G T G G A C T G G T
 G A A T T C G T C C G T T G G A C C G A A C C A C G G T T G G T G G C A T G G C C T T G A

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SEQ ID No. 6

AAPFNGTMMQYFEWYLPDDGTLWTKVANEANNLSSLGITA
 LWLPAYKGTSRSDVGYGVYDLYDLGEFNQKGTVRTKYGT
 20 KAQYLQAIQAAHAAGMQVYADVVDHKGADGTEWVDAVE
 VNPSDRNQEISGTYQIQAWTKFDFPGRGNTYSSFKWRWYH
 FDGVDWDESRKLSRIYKFRGIGKAWDWEVDTEGNYDYLM
 YADLDMDHPEVVTELKNWGKWyVNTTNIDGFRLDAVKHIK
 FSFFPDWLSYVRSQTGKPLFTVGEYWSYDINKLHNYITKT
 25 DGTMSLFDAPLHNKFYTASKSGGAFDMRTLMTNTLMKDQP
 TLAVTFVDNHDTEPGQALQSWVDPWFKPLAYAFILTRQEG
 YPCVFYGDYYGIPQYNIPSLKSKIDPLLIARRDYAYGTQH
 DYLDHSDIIGWTREGGTEKPGSGLAALITDGPGGSKWMYV
 GKQHAGKVfyDLTGNRSDTVTINSdGWGEfKVNGGSVSVW
 30 VPRKTTVSTIARPITTRPWTGEFVRWTEPRLVAW

